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In re Patent Application of
ZANGERL
Serial No. 10/500,045
Filed: JUNE 23, 2004

REMARKS

The Examiner is thanked for the thorough examination of the present application, and for indicating the patentability of the subject matter of dependent Claims 13, 19, 24, 30, 35, and 41. Based on the arguments presented below, all claims are believed to be patentable.

I. The Claimed Invention

Independent Claim 11, for example, is directed to a redundant GPS antenna splitter apparatus comprising a plurality of GPS antennas and respective amplifiers connected thereto and a plurality of passive splitters connected downstream from the amplifiers and having a plurality of GPS outputs to be connected to respective transmitters so that each GPS output has a voltage thereon corresponding to the respective transmitter. The GPS antenna splitter further includes a DC control stage comprising at least one current measuring stage for selectively providing a DC supply to the GPS antennas and respective amplifiers based upon the GPS outputs. Independent Claim 22 is directed to a GPS antenna splitter apparatus similar to independent Claim 11. Independent Claim 33 is directed to a method counterpart of independent Claim 11.

II. The Claims Are Patentable

The Examiner rejected independent Claims 11, 22, and 33 over the Stanley C. Maki paper in view of the Hopf Elektronik Technical Description paper and Bullock et al. paper. The Maki reference discloses a GPS inertial guidance

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system for space boosters with antenna redundancy. (Pages 176, 180). The Maki reference discloses redundant antennas for single-failure tolerant characteristics. (Page 180). The Maki reference further discloses, in alternative to two antennas, a single string antenna with splitter. (Figure 1). The Maki reference discloses that incorporating the splitter or any other elements introduces undesired unreliable elements. (Page 181). Further, the Maki reference discloses the absolute need for reliability in GPS navigation systems in space boosters. (Page 180).

The Hopf reference discloses an 8x1 GPS power splitter. The Hopf reference discloses a GPS antenna signal being divided once, amplified, and divided two more times to provide eight outputs. (Page 4). The Bullock et al. reference discloses a GPS receiver with an antenna power supply circuit comprising a current sensing resistor, two rail to rail amplifiers, a pass transistor, and a voltage divider to set the limits of the under and over current limits. (Page 319). The Bullock et al. reference discloses shutting down the pass resistor and decreasing voltage to the antenna when an over-current condition is detected.

The Examiner correctly noted that the Maki reference did not disclose a plurality of passive splitters connected downstream from the amplifiers and having a plurality of GPS outputs to be connected to respective transmitters, as recited in independent Claims 11, 22, and 33, and looked to the Hopf reference to provide such. The Hopf reference fails to disclose the above highlighted recitation. As discussed above, the Hopf reference discloses 8x1 GPS power splitter

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with no connected transmitters. Therefore, for this reason alone, independent Claims 11, 22, and 33 are patentable over the prior art.

Further, Applicant respectfully submits that the proposed combination of the Hopf reference and the Maki reference is improper. As discussed above, the Maki reference teaches that reliability is a priority design concern in GPS navigation of space boosters. Further, the Maki reference teaches that including additional elements, specifically mentioning splitters and amplifiers, in the disclosed design may create reliability problems. In addition, the Maki reference appears to teach that splitters and multiple antennas are mutually exclusive design alternatives. (Figure 1).

Further, the Maki reference teaches placement of amplifiers outside the splitter element to compensate for signal loss due to splitting, whereas the Hopf reference teaches amplification within the splitter device itself. Combination of the two references would produce redundant and wasteful amplification devices; this further reduces the reliability of the Maki reference. Therefore, given there is no motivation or suggestion to combine the Maki reference and the Hopf reference, Applicant submits that a person of ordinary skill in the art would not have been motivated to combine the references as posed by the Examiner. Rather, the Maki reference teaches away from introducing elements between the GPS antenna and receiver. Consequently, for this reason alone, independent Claims 11, 22, and 33 are patentable over the prior art.

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The Examiner correctly noted that the Maki reference failed to disclose a DC control stage comprising at least one current measuring stage for selectively providing a DC supply to the GPS antennas and respective amplifiers based upon the GPS outputs, as recited in independent Claims 11, 22, and 33, and looked to the Bullock et al. reference to provide such. The above discussion regarding adding unreliable elements into the Maki reference disclosure applies similarly to this proposed combination by the Examiner. Therefore, given there is no motivation or suggestion to combine the Maki reference and the Bullock et al. reference, the Applicant submits that a person of ordinary skill in the art would not have been motivated to combine the references as posed by the Examiner. Rather, the Maki reference teaches away from introducing elements between the antenna and receiver. Therefore, for this reason alone, independent Claims 11, 22, and 33 are patentable over the prior art.

Accordingly, it is submitted that independent Claims 11, 22, and 33 are patentable over the prior art. Their respective dependent claims, which recite yet further distinguishing features, are also patentable over the prior art and require no further discussion herein.

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CONCLUSIONS

In view of the arguments presented above, it is submitted that all of the claims are patentable. Accordingly, a Notice of Allowance is respectfully requested in due course. Should any minor informalities need to be addressed, the Examiner is encouraged to contact the undersigned at the telephone number listed below.

Respectfully submitted,



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CERTIFICATE OF FACSIMILE TRANSMISSION

I HEREBY CERTIFY that the foregoing correspondence has been forwarded via facsimile number 571-273-8300 to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 this 5th day of October, 2006.

